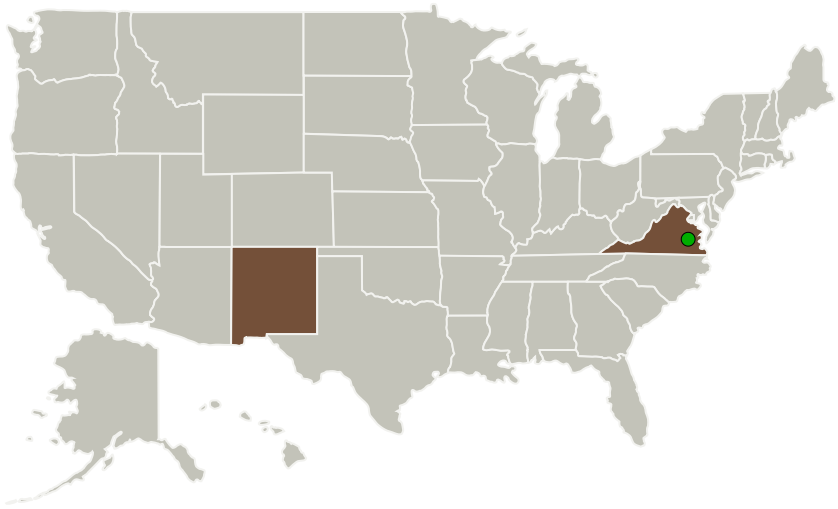
Inexpensive Instrument for In Situ Characterization of Particulate Matter in Volcanic Ash Plumes, Phase I

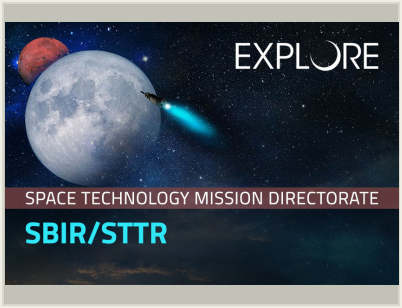
Completed Technology Project (2011 - 2011)

Project Introduction

Volcanic research is a significant part of the "Earth Surface & Interior" focus area of the NASA Earth Science program. After a volcanic eruption, the smallest ash particles can remain in the atmosphere for days to months affecting public health in the surrounding regions and the radiation balance on Earth. Airborne volcanic ash particulate matter (PM) also poses a major threat to aviation and would therefore be essential to distinguish and identify by remote sensing and in situ techniques. Vista Photonics in collaboration with New Jersey Institute of Technology proposes to develop an innovative technology for in situ characterization of PM in volcanic plumes, including measurement of PM size distribution function and concentration. The Phase I study will demonstrate the feasibility of the proposed technology and outline the design of the Phase II prototype instrument. The successful completion of this program will lead to development of a very inexpensive compact PM measurement instrument suitable for use on a variety of ground based and airborne platforms including remotely operated aircraft and surface craft, and even disposable devices, such as dropsondes.

Primary U.S. Work Locations and Key Partners





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Organizations Performing Work	Role	Type	Location
Vista Photonics, Inc.	Lead Organization	Industry	Santa Fe, New Mexico
Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

Primary U.S. Work Locations	
New Mexico	Virginia

Project Transitions

February 2011: Project Start

September 2011: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/138647)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Vista Photonics, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

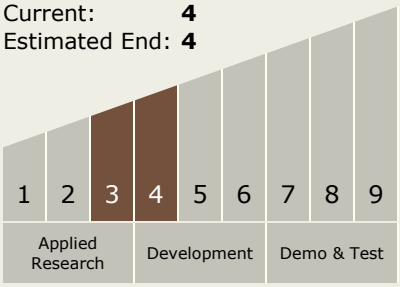
Carlos Torrez

Principal Investigator:

Andrei Vakhtin

Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



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Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.4 Environmental Monitoring, Safety, and Emergency Response
    - TX06.4.1 Sensors: Air, Water, Microbial, and Acoustic

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System